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While it is always great when mathematics educators can include substantive studies of primary sources in their courses—such as the projects described by the TRIUMPHS team in the December 2018 issue of these *Notes* [1]—sometimes instructors may just be looking for a quick historical illustration, fact, or concept that illuminates a given day's lesson. One extensive and eye-catching resource for such glimpses of the past is the Mathematical Treasures collection found in *Convergence*, the Mathematical Association of America's online, open-access journal devoted to the history of mathematics and its uses in teaching. The collection's over 1200 pages provide images of mathematical objects and of selected pages from mathematical manuscripts and texts housed in various libraries, museums, and private collections, all of which may be shared in your mathematics classroom. Below, I highlight some of my favorite Mathematical Treasures and explain what I think makes them engaging for students.

Figure 1. Autographed title page from De Morgan's copy of *La Methode des Fluxions*. *Convergence* Mathematical Treasures.

In 1750, the Comte de Buffon—better known today as a naturalist—translated into French Isaac Newton's *Method of Fluxions* (written in 1671 but published posthumously in 1736) [Figure 1]. But the confluence of great figures in the histories of mathematics and science doesn't end there, as this particular copy was purchased by Augustus De Morgan in 1852. Note that he added both his autograph and information about how he found the book near the place of publication on the title page [6].

Another posthumous publication by a giant in the history of mathematics, the 1787 *Institutiones Calculus Differentialis* by Leonhard Euler, catches our attention with both its mathematical content—Euler wasted no time by bringing in differentials on the very first page—and its typographical beauty [Figure 2]. As I've written elsewhere, "I can't get enough of the wonderful engraved artwork of texts of the sixteenth through the early nineteenth centuries. Don't you love the cherubs doing geometry in the 'E'? Given that it is Euler and the letter e, I couldn't help imagining for a moment one of the little guys being Euler" [3; 7].

Figure 2. First page of Euler's 1787 *Institutiones Calculus Differentialis*. *Convergence* Mathematical Treasures.

Historical books do not need to have made major theoretical contributions to be educational. For example, the next two Treasures help us encourage preservice teachers, liberal arts students, and others to think about how humans learn mathematics. Before mass-printed textbooks were readily available, children and teenagers typically wrote down what their teachers recited or copied from the class's single textbook in a "cyphering book." These were carefully prepared, often lavishly decorated, and preserved within a family for generations. The pages shown here were prepared by 15-year-old Mary Serjant, who was born in England in 1673 [Figure 3]. On the first page, she was working on "broken addition," and on the second she showed an example of the Rule of Three, a proportion containing three known quantities and one unknown [4].

Figure 3. Two pages from Mary Serjant's 17th-century copybook. *Convergence* Mathematical Treasures.

The cyphering-book tradition was especially associated with Christ's Hospital in London [2]. Another innovative type of teaching material from that institution is Johann Alexander's 1693 textbook, which is really a workbook with a blank page facing every page of text [5][Figure 4]. A student has attempted to solve this right-triangle problem for *x*. Did they find the right answer?
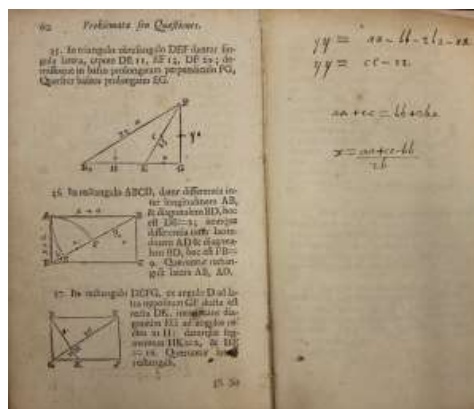

Figure 4. Page 60 (and its facing blank page with student work) from Alexander's 1693 *Synopsis Algebraica*. *Convergence* Mathematical Treasures.

The full collection can be perused via an index organized alphabetically by author/creator as well as in several subindices by repository or form of material. Is there a historical document or object that you like to use in class which is not yet represented in Mathematical Treasures? Submissions can be sent to convergence@maa.org and should include:

- **High-quality and informative images** of a historical mathematics book or object. Images of books typically include the title page and one or more samples of the content. Check the Index of Mathematical Treasures for works that are already included in the collection.
- **Permission** from the owner of the book or object to publish the images, if the repository has not already contributed to *Convergence*'s collection (a list is provided at the bottom of the Index). If necessary, provide information on the **owning library/archives/website** for these Acknowledgments.
- Approximately 300 words of **text describing the historical significance** of the book and author (or object and creator). The text should also explain why the content samples you have chosen are historically or pedagogically interesting. Think about why or how another instructor might want to use these images in the classroom. **This text must be original to you;** do not copy from *Wikipedia*, *MacTutor*, or any other source.
- A **bibliography** of any sources consulted in preparing the description.

References

[1] Barnett, Janet Heine. (2018) Why Use Primary Sources in a Mathematics Classroom? *CMS Notes* 50(6), 16–17. "TRIUMPHS" is an acronym for the NSF-funded project, "Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources."

[2] Ellerton, Nerida, and M. A. (Ken) Clements. (2012) *Rewriting the History of School Mathematics in North America, 1607–1861: The Central Role of Cyphering Books*. Dordrecht: Springer.

[3] Shell-Gellasch, Amy. (2020, February/March) A Quick Look Back: Mathematical Treasures on Convergence [Euler, *Institutiones Calculus Differentialis* (1787)]. *MAA FOCUS* 40(1), 27.

[4] Swetz, Frank J. (2013, August) Mathematical Treasure: Mary Serjant's Copybook. *Convergence* 10.

[5] Swetz, Frank J. (2014, February) Mathematical Treasure: Alexander's Synopsis Algebraica. *Convergence* 11.

[6] Swetz, Frank J. (2019, February) Mathematical Treasure: Newton's Fluxions Owned by De Morgan. *Convergence* 16.

[7] Swetz, Frank J. (2019, November) Mathematical Treasures – Leonhard Euler's Differential Calculus. *Convergence* 16.

Amy Shell-Gellasch is serving her second term on the CSHPM Executive Council. She teaches mathematics at Eastern Michigan University and has held numerous positions in the MAA, where she is currently Past Chair of the Special Interest Group in History of Mathematics and Chair of the Michigan Section. This column is based upon her ongoing series in MAA FOCUS, "A Quick Look Back: Mathematical Treasures on Convergence."